

REMARKS

Favorable reconsideration of this application is requested in view of the above amendments and in light of the following remarks and discussion.

Claims 1-10 and 12-18 are pending in the application. Claims 1, 2, 6, and 7 have been presently amended. Claim 11 has been canceled without prejudice. No new matter is added.¹

In the Office Action, Claims 1-18 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1-4, 6-7, 11-14, and 17-18 were rejected under 35 U.S.C. §102(a) as being anticipated by Masuda et al (U.S. Pat. Appl. Publ. No.2001/0015175). Claim 15 was rejected under 35 U.S.C. §102(a) as being anticipated by or under 35 U.S.C. § 103(a) as obvious over Masuda et al. Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Masuda et al in view of Ueda et al (Japanese Laid Open Patent Publication No. H08-107102). Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Masuda et al. Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Masuda et al in view of Okawa et al (Japanese Laid Open Patent Publication No. 20003-49070). Claims 10 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Masuda et al in view of Howald et al (U.S. Pat. No. 6,074,516).

Independent Claims 1, 2, and 6 presently define a vacuum vessel that houses an article to be plasma-treated in a plasma region and that includes a lower electrode that is provided inside the vacuum vessel and onto which is placed the article to be plasma-treated. An upper electrode main body is provided above the lower electrode to form the plasma region in the vacuum vessel. The upper electrode main body has formed therein an opening through which passes light for detecting an extent of progress of plasma treatment of the article to be treated

¹ Support for the changes to claims 1, 2, and 6 is provided by Figures 2-5, and the accompanying description in the specification.

in the plasma region. An upper electrode cover is joined to a lower surface of the upper electrode main body and faces the plasma region. The upper electrode cover has formed therein a hole at a location corresponding to the opening of the upper electrode main body.

In these claims, a transparent window member that is made of a transparent member which is a separate body to the upper electrode cover, has a shape insertable into the hole of the upper electrode cover, and is retainably and upwardly removably fitted in the hole of the upper electrode cover. The transparent window member is disposed to face the plasma region and has a part through which the light for detecting an extent of progress of plasma treatment passes. The transparent window member has no through hole in the part through which light passes.

In the Office Action, newly cited primary reference Masuda et al disclose a magnetic field UHF band electromagnetic wave radiation/discharge type plasma etching apparatus (see paragraph [0059] of Masuda et al). Applicant respectfully submits that Masuda et al do not disclose or suggest a number of features in the claimed invention.

Firstly, the plasma processing apparatus in Masuda et al has a structure (plate 115) formed with at least one through-hole 115B that is formed at a position opposite to an optical reflector W of a vacuum chamber (paragraph [0019]), and measures optical information from the surface state of the optical reflector through an optical transmitter 141 installed on the back of the through-hole 115E (paragraphs [0015] and [0020]). Applicant submits that, since the optical information is measured via the through-hole, the plasma processing apparatus in Masuda et al cannot reduce light transmission characteristics due to adhesion of reaction productions on the optical transmitter 141. Furthermore, the through-hole diameter is so small (as large as 0.5 mm, for instance) and the aspect ratio is so large from 5 to 100 that plasma cannot enter internal through-holes to generate abnormal discharge (see paragraphs [0040], [0041] and Figures. 1, 2 and 9).

Although Masuda et al state at paragraph [0113] that their invention can also be applied to a parallel plate plasma processing apparatus, Masuda et al merely disclose a plasma processing apparatus of a magnetic field UHF band electromagnetic wave radiation/discharge type which differs from the parallel plate plasma processing apparatus of the present invention having the defined upper and lower electrodes. More specifically, Applicant submits that the disk formed conductor 111 disclosed in Masuda et al simply constitutes part of a UHF antenna 110 for use in an electromagnetic wave radiation/discharge type plasma processing apparatus, and accordingly differs from an upper electrode of a parallel plate plasma processing apparatus of the present invention.

Secondly, the Office Action contends that the plate 115 of Masuda et al corresponds to an upper electrode cover of this invention. Applicant respectfully submits that this position is incorrect, as will be discussed below.

As mentioned on pages 11-12 of the present specification, the upper electrode cover 31 serves to isolate the main body 32 of the upper electrode from a plasma region 41 formed inside an internal chamber 15. The upper electrode cover 31 has a part through which light passes and which is formed with a hole 31b. In the present invention, there is provided a window member 31a (i.e., the claimed transparent window member) fitted to the hole 31b. As understood from the illustration in Applicant's FIG. 2, the light passing part of the window member 31a is not formed with a through hole.

Meanwhile, the plate 115 in Masuda et al is disposed between the process chamber 100 and the antenna 110. Moreover, the gist of Masuda et al's invention resides in that at least one through hole (see for example each of the five through holes shown in Figure 2 of Masuda et al), which is small in diameter and large in aspect ratio, is formed in the plate 115, making it possible to obtain optical information by causing light to pass through the through hole.

This feature of Masuda et al teaches away the present invention's window member having a part through which light passes that is not formed with a through hole. Hence, the plate 115 of Masuda et al including a plurality of through holes 115B differs from the window member of the present invention and therefore differs from claimed upper electrode cover of the present invention which has a hole therein of a shape complementary to a shape of the window member.

Thirdly, the Office Action asserted that part denoted by reference numeral 115C shown in FIG. 9 of Masuda et al corresponds to the window member of the present invention. Applicant respectfully submits that this position is also incorrect.

In paragraph [0106] of Masuda et al, explanations are given only for an optical transmitter 141 constituted by an optical fiber and a conductor 111 formed with a gas supplier 111B. No explanations are given there of plate part 115C. From a comparison of Figures 2 and 9 of Masuda et al, it is reasonable to conclude that part 115C is a metallic flange containing the plurality through holes discussed above. Accordingly, it is apparent that Masuda et al entirely lack teachings regarding a plate part 115C made of a *transparent member* and removably mounted to the plate 115.

Thus, as discussed above, the plate 115 of the plasma processing apparatus of Masuda et al need not be provided with a member corresponding to the transparent window member of the present invention. Therefore, even though plate part 115C is shown in FIG. 9, the plate part 115C is not disclosed as and need not be made of a transparent member. Thus, Masuda et al cannot be considered as disclosing or suggesting the transparent window member of the present invention.

Since Masuda et al fail to disclose or suggest the defined upper and lower electrodes, the defined upper electrode cover having an opening for a transparent window element, and the defined transparent window having no through hole in the part through which light

passes, independent Claims 1, 2 and 6 cannot be consider as being anticipated by or obvious from Masuda et al.

Moreover, the deficiencies in Masuda et al are not overcome by Ueda et al, Okawa et al, or Howald et al. Remarks concerning the deficiencies of these references were filed in the last response. Indeed, the outstanding Office Action relies on Ueda et al and Okawa et al for their teaching of an upper electrode cover member made of quartz and relies on Howald et al for their teaching of an upper electrode cover member made of sapphire and their teaching of affixing the window member with tape.

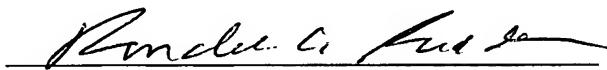
Hence, the applied references (individually or in combination) do not disclose or suggest the features of the present invention. Furthermore, as noted above, Masuda et al teach away from those aspects of the present invention relating to a transparent window material having no through hole in the part through which light passes.

Hence, for all these reasons, independent Claims 1, 2, and 6 (and the claims dependent therefrom) patentably define over the applied references.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Respectfully submitted,

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